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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/600,607	07/19/2000	MAARTEN KUIJPER	PHN16.643	5334

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EXAMINER

SCHECHTER, ANDREW M

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 07/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/600,607

Applicant(s)

KUIJPER, MAARTEN

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on November 19, 1997. It is noted, however, that applicant has not filed a certified copy of this application as required by 35 U.S.C. 119(b).

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Image projection system with TN-LCD having single birefringence-compensating element".

3. The specification at p. 3 refers to U.S. Patent No. 5,583,679 having $\phi = 45^\circ$. This does not appear to be the case, though it is the case for U.S. Patent No. 5,583,677 to the same inventor (*Ito et al.*). It would be appreciated if applicant could clarify this point.

Drawings

4. The drawings are objected to because of the way Fig. 2(b) shows the angle ϕ between 29 and 41. The examiner is under the impression that the direction of 35 would be vertically down in the plane of the page (negative y-direction), in which case the angle should be swept out below the x-axis (compare p. 7, lines 30-32). Is the drawing consistent with the definition of ϕ ? (This is a minor point, since only the

Art Unit: 2871

magnitude of ϕ is presently used in the claims.) A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 6, the specification on p. 7 states that “[a]n element with negative birefringence can be realized in different manners. The element may comprise ... a plurality of positive birefringent foils...” The specification does not further explain how a plurality of birefringent foils may be made into an element having negative birefringence. Without this knowledge, one of ordinary skill in the art would not be able to make and use the invention of claim 6. This rejection can be overcome, for instance, by indicating a prior art reference showing one of ordinary skill in the art would know how to make a negative birefringence foil from a plurality of positive birefringence foils.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim recites "the element comprises a plurality of positive birefringent foils, at least one of which has a tilted optical director profile", wherein the element itself as a whole (from claim 1) "has a tilted optical director profile whose projection in the plane of the polarizers encloses an angle different from 0". Given a device with a plurality of positive birefringent foils, each of which having optical director profiles which mutually differ, it is unclear to the examiner how the "optical director profile" of the entire element is determined. Is there a conventional way of doing this? Essentially, is the "optical director profile" of a plurality of birefringent foils a well-defined quantity? If it is not, then it would be unclear whether a device would fall within the scope of the present claims; hence this rejection under 35 U.S.C. 112, 2nd paragraph. Also, considering such a device [e.g. *Masumoto*] as possible prior art, the examiner believes [since individual element(s) making up the combined element have the recited property] that the device inherently has the property which is recited in the claim, but the reference is silent as to the "optical director profile" of the combined element, so a rejection below is given in view of 35 U.S.C. 102/103, which shifts the burden on the applicant to show an unobvious difference.

9. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation “comprises a single birefringence-compensating element”; this language is ambiguous. “Comprises” is open-ended, implying the possible existence of other elements, while “single” suggests that there are no other birefringence-compensating elements in the device. Would a device with a second birefringence-compensating element, either in the same location or in other location, be within the scope of these claims? For examining purposes, we will assume that the applicant intends to include a stack containing a plurality of foils in a single location, but not several birefringence-compensating elements in different locations.

Also regarding claim 1, the examiner understands “TN (twisted nematic)” to exclude STN (super-twisted nematic) devices, which are generally considered separate from TN devices, though they do have nematic material which is twisted. If the applicants have a different intention, they should make this clear in their response.

Finally, the “active rubbing direction” is defined [p. 2] as the direction which determines the direction in which the contrast is to be improved. Given a device, it is not possible in general to know the intent of the designer (which direction was desired to have improved contrast). For examining purposes, it is assumed that, given a device, either rubbing direction can be taken as the “active” one.

Claims 2-7 depend on claim 1.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 3, 4, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Xu*, U.S. Patent No. 6,057,901 in view of *Abileah et al.*, U.S. Patent No. 5,737,048.

Xu discloses [see Fig. 14] a liquid crystal display panel comprising polarizers [3, 19] around a TN liquid crystal panel [11], with a birefringence-compensating element [31] between the panel and a polarizer [it can be used singly, as emphasized by the author, col. 9, lines 39-42]. The element has a tilted optical director profile.

Xu does not disclose the intended use of the panel being as part of an image projection system with an illumination system and an optical system (either an ordinary projector or a head-mounted one); the examiner takes official notice that this intended use for liquid crystal panels is well-known and conventional, and would be obvious to

Art Unit: 2871

one of ordinary skill in the art motivated by, among other reasons, having additional commercial applications for the panel and being able to display the image to a larger audience.

Xu does not explicitly disclose the angle ϕ . First, the examiner notes that given the above discussion of the “active rubbing direction” being either of the two rubbing directions (which are at 90° to each other), the angle ϕ must inherently be different from 0° with respect to one of them, so the limitation is met. Second, the angle ϕ is discussed by *Abileah* (of which *Xu* is also an author) in an analogous context [see Figs. 4-6, etc.]. They teach that the effect of rotating the optical axis [by an angle labeled θ in that reference] is “to shift the viewing zone or envelope of the display” and teaches that this is advantageous “because it allows for excellent positive or negative vertical viewing characteristics in situations where they are needed” [col. 9, line 39 – col. 10, line 4]. In particular, they teach using an angle of “most preferably from about 6°-10°”. It would be obvious to do so in the device of *Xu*, motivated by the above teaching of *Abileah*.

Claims 1, 3, 4, 7, and 8 are therefore unpatentable.

13. Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kawata et al.*, U.S. Patent No. 5,736,067 in view of *Abileah et al.*, U.S. Patent No. 5,737,048.

Kawata discloses [see Figs. 2, 4] a liquid crystal display panel comprising polarizers [A, B] around a TN liquid crystal panel [TNC], with a birefringence-compensating element [RF1, note col. 16, lines 35-37 that the invention may be used

Art Unit: 2871

with just one of RF1 and RF2] between the panel and a polarizer. The element has a tilted optical director profile and a negative birefringence.

Kawata does not disclose the intended use of the panel being as part of an image projection system with an illumination system and an optical system (either an ordinary projector or a head-mounted one); the examiner takes official notice that this intended use for liquid crystal panels is well-known and conventional, and would be obvious to one of ordinary skill in the art motivated by, among other reasons, having additional commercial applications for the panel and being able to display the image to a larger audience.

Kawata does not explicitly disclose the angle ϕ . First, the examiner notes that given the above discussion of the “active rubbing direction” being either of the two rubbing directions (which are at 90° to each other), the angle ϕ must inherently be different from 0° with respect to one of them, so the limitation is met. Second, the angle ϕ is discussed by *Abileah* in an analogous context [see Figs. 4-6, etc.]. They teach that the effect of rotating the optical axis [by an angle labeled θ in that reference] is “to shift the viewing zone or envelope of the display” and teaches that this is advantageous “because it allows for excellent positive or negative vertical viewing characteristics in situations where they are needed” [col. 9, line 39 – col. 10, line 4]. In particular, they teach using an angle of “most preferably from about 6°-10°”. It would be obvious to do so in the device of *Kawata*, motivated by the above teaching of *Abileah*. Claims 1-5, 7, and 8 are therefore unpatentable.

Art Unit: 2871

14. Claims 1, 4, and 6-8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over *Masumoto et al.*, U.S. Patent No. 5,490,006.

Masumoto discloses an image projection system comprising an illumination system [102], a modulation system [101], and an optical system [103], the modulation system comprising a liquid crystal image display panel having polarizers [11, 15], TN liquid crystal enclosed between them [18, see abstract], a single birefringence-compensating element [13, or 12 and 13] between the TN layer and one of the polarizers, which has a tilted optical director profile whose projection has an angle ϕ different from zero with the active rubbing direction [either] of the layer [see Fig. 7, and discussion above under 35 U.S.C. 112]. Claim 1 is therefore anticipated or unpatentable.

The additional limitations of claims 4, 6, and 8 are met by the above device, so they are anticipated or unpatentable as well.

The reference does not disclose using the panel in a head-mounted display with head-supporting means; however, the examiner takes official notice that this is a well-known and conventional use for liquid crystal light valves of this type, and it would have been obvious to use the above device in this fashion, motivated among other reasons by the advantage of having additional marketable applications for the product. Claim 7 is therefore unpatentable as well.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,638,197 to *Gunning, III et al.* and U.S. Patent No. 5,504,603 to *Winker et al.* disclose the use of O-plates, possibly in combination with other types of birefringent plates. These are positively birefringent plates which have tilted optical profiles.

U.S. Patent No. 6,292,242 to *VanderPloeg et al.* discloses [see Figs. 13, 15(a)] a device with positive tilted plate [2] rotated by an angle of 4° , but it has an additional birefringent element [4] in the device. Considering the discussion above under 35 U.S.C. 112, does the applicant intend this arrangement to fall within the scope of the claims? Likewise, U.S. Patent No. 5,895,106 to *VanderPloeg et al.* discloses a variety of arrangements of multiple tilted retarders – do these fall within the scope of the claims?

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Sikes can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Art Unit: 2871

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Andrew Schechter
July 1, 2002



**KENNETH PARKER
PRIMARY EXAMINER**